

11. COLUMBIA RIVER TO STRAIT OF JUAN DE FUCA, WASHINGTON

(1) This chapter describes the Pacific coast of the State of Washington from the Washington-Oregon border at the mouth of the Columbia River to the northwesternmost point at Cape Flattery. The deep-draft ports of South Bend and Raymond, in Willapa Bay, and the deep-draft ports of Hoquiam and Aberdeen, in Grays Harbor, are described. In addition, the fishing port of La Push is described. The most outlying dangers are Destruction Island, marked by a light and fog signal, and Umatilla Reef, marked by a lighted buoy. A U.S. Navy operating/exercise area parallels the coastline from about 10 miles N of Point Brown to Cape Alava, extending from 3 miles offshore to about 50 miles offshore.

(2) **The Olympic Coast National Marine Sanctuary**, off the Olympic Peninsula of Washington State, including the waters of the Strait of Juan de Fuca, extends from Koitlah Point due north to the international boundary seaward to the 100 fathom isobath, thence southward to a point due west of the mouth of the Copalis River cutting across the heads of Nitnat, Juan de Fuca, and Quinault Canyons. (See **15 CFR 922**, chapter 2, for limits and regulations.)

(3) **Area to be Avoided-Washington Coast.**—The International Maritime Organization (IMO) has adopted the waters off the Washington Coast as an area to be avoided. In order to avoid risk of pollution in the area designated as the Olympic Coast National Marine Sanctuary (OCNMS), all ships bound to and from the Strait of Juan de Fuca, engaged in the trade of carrying hazardous cargo, including but not limited to tankers and other bulk carriers and barges, should avoid the area bounded by a line connecting the following points:

(4) 48°23.3'N., 124°38.2'W.

(5) 48°23.5'N., 124°38.2'W.

(6) 48°25.3'N., 124°46.9'W.

(7) 47°51.7'N., 125°15.5'W.

(8) 47°07.7'N., 124°47.5'W.

(9) 47°07.7'N., 124°11.0'W.

(10) **COLREGS Demarcation Lines.**—The lines established for this part of the coast are described in **80.1370 through 80.1380**, chapter 2.

(11) **Vessel Arrival Reports.**—The Washington State Department of Ecology requires that all tank vessels, and certain cargo and passenger vessels, submit an Advanced Notice of Entry (ANE) Report at least 24 hours prior to entering Washington waters.

(12) A tank vessel is defined as any vessel that carries, or is certified to carry, oil in bulk as cargo or cargo residue. A cargo vessel is any self-propelled vessel in commerce that is 300 gross tons or more. A passenger vessel is any vessel 300 gross tons or more with a fuel capacity of at least 6,000 gallons that carries passengers for compensation.

(13) Vessels required to submit an ANE Report must provide the following information:

(14) a. Vessel name, flag, call sign, and IMO (Lloyd's) number or official number.

(15) b. Last port of call.

(16) c. Current position, time, course, and speed.

(17) d. Name and ETA to port of destination.

(18) e. Agent name, if any.

(19) f. Cargo; dangerous or pollutant cargo by name, UN number, or IMDG Code number of certain dangerous cargoes as de-

fine in **33 CFR 160.203**. (The vessel must also report the items required in **33 CFR 160.211 (a)(1) through (a)(8) and (b)** when applicable.)

(20) g. Any hazardous conditions, defects, or deficiencies in charts, publications, hull, steering gear, propulsion machinery, navigation equipment, anchors or cables, or required radio communications equipment.

(21) h. On scene weather, if severe.

(22) i. Identify the vessel's Oil Spill Contingency Plan, the vessel's official number, owner or operator's full address, and bunking activities while in Washington, if any.

(23) The Washington State Department of Ecology also requires owners and operators of vessels to submit Safety Reports when a vessel experiences an unusual circumstance. A Safety Report is required for any of the following conditions:

(24) a. Any abnormality or malfunction of any steering, propulsion, or safety system, or navigation systems required by federal or international law or regulation;

(25) b. A breach of hull or the integrity of a cargo or bunker tank that causes or that may reasonably be expected to cause an oil spill or loss of stability;

(26) c. Damage from fire or explosion;

(27) d. An incomplete engineering or deck complement under United States law or regulation under the requirements of the vessel's country of registry; or

(28) e. Any condition that could adversely affect the safety of a vessel, bridge, structure, shore area, or the environment.

(29) A Safety Report must be submitted with an Advance Notice of Entry, or, if the condition occurs after submittal of an ANE the Department must be notified immediately by phone or facsimile of the condition. To inquire or submit vessel information, vessel owners or operators may contact the Washington State Department of Ecology by calling 24 hours, 503-790-4868 (Columbia River and Grays Harbor) or 360-956-8378 (Strait of Juan de Fuca and Puget Sound). Facsimile Safety Reports should be sent to 1-800-664-9184 or 360-407-7288. Cargo, passenger, fishing and tank vessels are subject to boarding by Washington State Department of Ecology inspectors when in port. Tank vessels are required to have a Tank Vessel Oil Spill Prevention Plan on file with Ecology or must obtain a waiver prior to entering Washington State waters. Washington State also has safe bunkering procedures that must be followed during fuel transfers. For more information contact Ecology by calling 24 hours, 503-790-4868 (Columbia River and Grays Harbor) or 360-956-8378 (Strait of Juan de Fuca and Puget Sound). **To report an oil spill call 1-800-258-5990.**

(30) **Chart 18500.**—From Cape Disappointment, the coast extends N for 22 miles to Willapa Bay as a low sandy beach, with sandy ridges about 20 feet high parallel with the shore. Back of the beach, the country is heavily wooded. Numerous summer resorts and cottages are along the beach. Landmarks along this section of the coast are few. The 10-fathom curve averages a distance of about 2.5 miles from the shore. There are no known offlying dangers S of the Willapa Bay entrance bar.

(31) **Weather, Columbia River to Strait of Juan De Fuca.**—The weather along this coast is usually mild, windy, and rainy in winter, cool and pleasant in summer, with some periods of fog. Close to shore, and particularly in Willapa Bay and Grays Harbor, wind

and fog conditions are often local and different from conditions offshore. Radiation fog often blankets these bodies of water, as well as rivers and shore points, in fall and winter. It can form any time when nights are clear and calm.

(32) Storms that move along this coast or a distance out to sea bring cloudy days with highs in the midforties (6.1° to 8.3°C) and lows in the middle to upper thirties (3.3° to 3.9°C). In winter, they cause rain on about 15 to 25 days per month and significant snow on 2 or 3 days. They are responsible for predominantly E to SE winds from October through March; these winds reach gale force 3 to 6 percent of the time. In the intermittent periods of settled weather, fog becomes an early morning hazard over rivers and protected bays. Visibilities drop below 0.5 mile (0.9 km) on 3 to 4 days per month, from October to February. Fog signals in waters like Grays Harbor operate up to 35 percent of the time.

(33) With the coming of spring, conditions improve. Storms become less frequent. Winds diminish and blow more from a W direction. Temperatures often rise into the low to middle fifties (11° to 13°C) during the day and fall to the low forties (5.0° to 5.6°C) at night. Visibilities are usually good, and rain falls on just 8 to 15 days per month.

(34) Summer is the true fog season along these shores. In general, advection fog reduces visibilities to below 0.5 mile (0.9 km) on 3 to 10 days per month; up to 16 days per month at Tatoosh Island. Fog signals blow 15 to 30 percent of the time. Conditions are worst in Grays Harbor and near the entrance to the Strait of Juan de Fuca. Temperatures are often in the sixties (16.1° to 20.6°C) during the day and around 50°F (10°C) at night. Winds are from a W to NW direction and usually less than 17 knots; calms occur up to 12 percent of the time. It rains on about 5 to 10 days per month.

(35) Fog remains a problem in autumn, although it is less frequent. Temperatures drop slowly with daytime readings often in the low to midsixties (16.1° to 19.4°C), dropping to the upper forties (8.9° to 9.4°C) at night. Rain falls more often. Winds become stronger and return to an E direction.

(36) **Chart 18504.**—Willapa Bay entrance is 24 miles N of the Columbia River entrance. The bay is used primarily by fishing and oyster boats. No deep-draft vessels have entered Willapa Bay since 1976. Oyster beds cover much of the shoaler areas of the bay. Lumber, fish, and other sea foods are shipped by rail and truck from South Bend and Raymond.

(37) **Prominent features.**—Leadbetter Point, the N extremity of North Beach Peninsula, is the S point of the entrance to Willapa Bay. It is low and sandy, and has no distinctive feature to mark its extremity; the chart limit of the trees is 2.2 miles S.

(38) **Cape Shoalwater**, the N point at the entrance, terminates in a low bluff about 50 feet high. The cape is sandy, and N portion is covered with trees to within 300 yards of the point.

(39) The N shore of the entrance to the bay is marked by timbered bluffs and ridges, several hundred feet high. In the daytime, scars on the cliffs often are visible before the light can be seen. The termination of the tree line on Leadbetter Point is sharply defined.

(40) The entrance is in the N part of the bay, which consists of two arms; the S, 18 miles long, and the E, 10 miles long. Both arms are filled with extensive shoals, large areas of which bare at low water. The S arm is separated from the ocean by a strip of low sand and sand dunes, averaging 1.5 miles in width and covered with trees until within 2.2 miles of Leadbetter Point. Numerous

cottages and summer resorts are along the seaward face of the narrow peninsula. The shore of the bay elsewhere is composed of low, rolling hills, 100 to 200 feet high, covered with dense growths of timber.

(41) **Willapa Bar** extends about 3 miles outside of a line joining Willapa Bay Light and Leadbetter Point. The bar channel is continually shifting, and depths over it vary from season to season. Because of the frequent changes in the position of the bar and difficulty in dredging the bar to project depth, depths have consistently been less than the 26-foot project depth. The buoys marking the channel over the bar are non lateral and moved from time to time because of the shifting sands and changing channel. Dredging range lights are temporarily established at the entrance at times during dredging operations. The entrance buoys and the dredging range lights do not necessarily mark the best water. The major channels in the bay are marked by aids to navigation.

(42) **Willapa River** flows into the E arm of the bay. Lights, buoys, daybeacons, and lighted and unlighted ranges mark the channel through the E arm and Willapa River to South Bend and Raymond.

(43) **COLREGS Demarcation Lines.**—The lines established for Willapa Bay are described in **80.1370**, chapter 2.

(44) **Channels.**—A Federal project provides for a 26-foot channel over the bar at the mouth of Willapa Bay, and a 24-foot channel from deep water in Willapa Bay to just above both forks of Willapa River at Raymond. The channel over the bar into Willapa Bay is subject to frequent change. (See Notice to Mariners and latest editions of charts for controlling depths.)

(45) **Anchorage** with good holding ground may be had at almost any point inside the bay. The anchorage generally used is off Toke Point in 30 to 40 feet, about 4.5 miles SE of Willapa Bay Light.

(46) **Tides.**—The mean range of tide at South Bend is 7.8 feet, and the diurnal range of tide is 9.8 feet. A range of about 14 feet may occur at the time of maximum tides.

(47) **Currents.**—In the entrance the current velocity is about 2.5 knots. Currents of 4 to 6 knots occur at times; the velocity is greatest on the ebb, particularly with S wind.

(48) In the channel at South Bend, the velocity is about 1.2 knots on the flood and 1.4 knots on the ebb. (See Tidal Current Tables for predictions for South Bend.)

(49) **Routes.**—From N or S, the course to Willapa Bay should be shaped to make the outermost lighted whistle buoy. From seaward in clear weather, the lights at the entrance of Grays Harbor, 14 miles N, and at North Head, 22 miles S, are distinguishing marks for fixing a vessel's position and the subsequent shaping of the course.

(50) Approaching from any direction in any weather, great caution is essential. The currents are variable and uncertain. Velocities of 3 to 3.5 knots have been observed between Blunts Reef and the Swiftsure Bank, and velocities considerably in excess of these amounts have been reported. Under such conditions, vessels should not shoal the water to less than 20 fathoms until the lighted whistle buoy off the entrance has been made.

(51) Navigators of deep-draft vessels should bear in mind the changeable nature of the bar. Strangers should not navigate the bay in thick weather.

(52) **South Bend** is on the S bank of Willapa River, 8 miles above Toke Point. The principal industries are lumbering, oystering, and fishing; two canneries are operating here. Willapa Harbor Airport is on the N bank of the river about 2.5 miles NW

of South Bend. **Raymond**, the principal town, is on the S bank of Willapa River at the junction of the South Fork, 3 miles above South Bend. There are sawmills here, and large quantities of lumber are shipped out.

(53) **Bridges**—There are no bridges over the main channel. The Burlington Northern railroad swing bridge across South Fork, 0.3 mile above its mouth, has a clearance of 8 feet. (See **117.1 through 117.59 and 117.1063(b)**, chapter 2, for drawbridge regulations.) Two fixed highway bridges over South Fork about 0.5 mile above the railroad swing bridge have a least clearance of 15 feet. The fixed highway bridge over North Fork at Raymond has a clearance of 20 feet. A railroad fixed bridge over **Ellis Slough** has a clearance of 24 feet.

(54) At The Narrows, 1 mile below the Port of Willapa Harbor wharf, the river is crossed by power cables with a minimum clearance of 165 feet.

(55) **Pilotage** for Grays Harbor, discussed later in this chapter, also pertains to Willapa Bay.

(56) **Towage**.—Tugs to 2,200 hp are available at Hoquiam in Grays Harbor. Arrangements should be made in advance through ships' agents or through the pilots.

(57) **Quarantine, customs, immigration, and agricultural quarantine**.—(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(58) **Quarantine** is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1, for details.)

(59) South Bend and Raymond are **customs ports of entry**.

(60) **Supplies**.—Diesel oil, gasoline, water, ice, and some marine supplies are available in South Bend and Raymond. Both South Bend and Raymond have small-craft moorages operated by the respective towns.

(61) **Repairs**.—The largest of two marine railways at South Bend can handle vessels 60 feet long and 19½ feet wide for hull repairs. A nearby machine shop and foundry does some engine repair work.

(62) **Tokeland** on **Toke Point**, is a summer resort. There is a dredged entrance channel and small-craft basin on the N side of the point. A light is on the outer end of a jetty on the S side and a daybeacon is on the N side of the entrance. In December 2000, the controlling depths were 4.3 feet in the left half and 11.6 feet in the right half of the entrance channel to the basin; the basin had depths of 9 to 13 feet, except for lesser depths along the SW edge. Berths, gasoline, diesel fuel, water, and ice are available either at the basin or nearby. A launching ramp is at the basin.

(63) **North River**, which enters the E arm 2 miles E of Toke Point, is navigated by small logging launches. The channel is marked by private daybeacons, and is navigable at high water to **Eatons Ranch**, 3 miles above the last daybeacon.

(64) The S part of Willapa Bay is used by light-draft vessels. **Bay Center** is a village just S of **Goose Point** (46°38.2'N., 123°57.5'W.). It is one of the many oyster places in this bay; there is also some fishing and crabbing. There are floats here for mooring fishing vessels; gasoline is available.

(65) The channel to Bay Center leads from deep water in Willapa Bay about 1.4 miles WNW of Goose Point, thence N of Goose Point, and thence S into Palix River to the basin at Bay Center. The channel is marked by lights and buoys. The channel is subject to continual change and buoys are frequently shifted to mark the best water. (See the Notice to Mariners and the latest edition of the chart for controlling depths.)

(66) **Palix River**, on the E side of the bay, is navigable for small logging tugboats and fishermen for about 1 mile up each of the three forks above their junction. The fixed highway bridge, about 1 mile below the forks, has a clearance of 25 feet.

(67) **Nemah River Channel**, 5 miles S of Goose Point, is marked by private aids. Controlling depths are about 4 feet to Daybeacon 20, thence 2 feet to Lynn Point, thence 1 foot to the junction of South and Middle Nemah Rivers.

(68) **Nahcotta Channel**, about 4.5 miles S of Goose Point, leads S between North Beach Peninsula on the W and Long Island Shoal and Long Island on the E to Shoalwater Bay. The channel is well marked and has depths greater than 20 feet.

(69) **Stanley Channel** leads from Nahcotta Channel at Long Island Junction Light, thence E of Long Island and **Stanley Peninsula** to the mouth of Naselle River. Shallow-draft boats with local knowledge can cross **Long Island Shoal**.

(70) **Long Island**, 5.5 miles long in a NW direction and of irregular width, wooded, and rising to over 100 feet in elevation, lies in the S arm of the bay near the head and nearly fills it.

(71) **Nahcotta**, on the E side of North Beach Peninsula, is a small village 9 miles S of Leadbetter Point. There are several large oyster plants here. The boat basin at Nahcotta has floats for small craft; diesel fuel and dry winter boat storage are available. In November 2000, the channel leading from deep water in Nahcotta Channel to the basin had a controlling depth of 5.2 feet, thence depths of 3 to 6 feet in the basin except for lesser depths along the N edge and shoaling to bare in the NW corner. The entrance to the basin is marked by lights.

(72) **Naselle River**, on the E side of the bay, is navigable by boats of 5 feet or less draft, at half tide or higher water, as far as the bridge at the village of **Naselle**, 10 miles above the mouth. This bridge marks the head of tide water at ordinary high tides. The river has numerous snags and submerged logs, and is crossed by power cables with least clearance of 60 feet; passage should not be attempted without local knowledge. Small logging and fishing boats operate on the river.

(73) **Bear River** enters at the SE corner at the head of **Shoalwater Bay**. A long, tortuous, unmarked channel across the flats makes entrance to the river difficult. Vessels of 5-foot draft or less can make the fixed bridge about 1.5 miles above the mouth at half tide.

(74) **Chart 18500**.—From Cape Shoalwater to Point Chehalis, the S point at the entrance to Grays Harbor, the coast extends for 11 miles as a low sand beach, backed by a heavy growth of timber.

(75) **Chart 18502**.—**Grays Harbor** entrance is about 40 miles N of Cape Disappointment and 93 miles S of Cape Flattery. The bay and its tributaries furnish an outlet to an extensive timber area. Grays Harbor is an important lumber port in the foreign and domestic trade. Oil is delivered by tanker; logs, lumber, pulpwood, and wood chips are shipped out.

(76) The bay at the entrance is about 2 miles wide, but shoals extending S from Point Brown contract the navigable channel to a width of 0.7 mile. From its entrance the bay extends E for 15 miles to the mouth of Chehalis River. The bay is filled by shoals and flats; these bare at low water and are cut by numerous channels.

(77) **Point Chehalis** is low and sandy and is bare of trees for 1.5 miles S of its extremity. A jetty extends seaward from the end of the point. A Coast Guard lookout tower is prominent on the point.

(78) **Grays Harbor Light** (46°53.3'N., 124°07.0'W.), 123 feet above the water, is shown from a 107-foot white truncated octagonal pyramidal tower on the seaward side of Point Chehalis.

(79) **Point Brown**, the N entrance point, is 2.5 miles N of Point Chehalis; it is low, rounding, and sandy, with shoals extending S and W which, together with those extending W from Point Chehalis, form the bar at the entrance. The point is wooded to within 0.5 miles of the extremity. A jetty extends W from the point. A small-craft basin is NE of the point. The entrance to the basin is marked by lights; the approach channel is marked by a line of lighted and unlighted dolphins. A submerged jetty extends about 0.6 mile NE from the N side of the basin entrance. A 30-ton mobile hoist is at the basin. Reported depths of 5 feet are available through the natural channel leading to the basin with similar depths inside the basin.

(80) **Prominent features.**—The country about Grays Harbor is flat and featureless, with few conspicuous objects. **Saddle Hill** (chart 18500), about 310 feet high, 8 miles N of the entrance and 2 miles inshore, is the most conspicuous feature.

(81) Grays Harbor Light shows prominently on a closer approach to the entrance. A micro tower, painted a red and white checkerboard pattern, is 3.6 miles NNE of the N jetty and a large rust-colored standpipe, lighted at night by floodlights, is 2.5 miles SSE of Point Chehalis. Both these objects are prominent on a closer approach, and the standpipe is reported to be visible for a considerable distance at night. In clear weather, **Brackenridge Bluff**, on the N shore 6 miles inside the entrance, is quite prominent. It is a reddish cliff about a mile long, rising in two places to a height of 80 feet; from seaward it is visible only through the entrance.

(82) In clear weather **Neds Rock**, off Brackenridge Bluff, shows prominently from inside the entrance; it is reddish.

(83) **COLREGS Demarcation Lines.**—The lines established for Grays Harbor are described in **80.1375**, chapter 2.

(84) Grays Harbor is served by the Marine Exchange of Puget Sound. (See Marine Exchange of Puget Sound, chapter 13, for details).

(85) **Channels.**—The entrance to Grays Harbor, between two jetties, is marked by two lighted ranges and buoys. Inside the bay, a Federal project channel provides depths of 36 feet to about Cow Point, thence 30 feet to Cosmopolis, about 9 miles above the bay entrance. The channel inside the bay to Cosmopolis is well marked. There is no deep-draft navigation above Cosmopolis. (See Notices to Mariners and latest editions of the charts for controlling depths for the dredged channel.)

(86) The jettied entrance has a tendency to shoal at the curve on the Point Chehalis side. Submerged sections of the N and S jetties extend seaward about 0.2 and 0.9 mile, respectively, from the visible sections. A lighted horn buoy, equipped with a high intensity flashtube, is off the submerged section of the S jetty.

(87) **Anchorage.**—The best anchorage is N of Westport and SE of **Damon Point** in 30 to 60 feet. The holding ground is good, and there is more swinging room here than elsewhere in the harbor.

(88) **Tides.**—The mean range of tide at Aberdeen is 7.9 feet, and the diurnal range of tide is 10.1 feet. A range of about 14 feet may occur at the time of maximum tides. (See the Tide Tables for daily predictions for Aberdeen, Wash.).

(89) **Currents.**—In the entrance, the average current velocity is about 1.9 knots on the flood and 2.8 knots on the ebb, but velocities may reach 5 knots. In the channels through the bay, the veloc-

ities seldom exceed 3 knots. It was reported that currents in the vicinity of the bar are very erratic, setting N close inshore and S offshore. (See Tidal Current Tables for daily predictions at the entrance to Grays Harbor.)

(90) **Routes.**—From N or S, the course should be shaped to make the entrance buoy. From seaward in clear weather, Saddle Hill, 8 miles N of the entrance, and Grays Harbor Light on Point Chehalis will be seen.

(91) Approaching from any direction in thick weather, great caution is essential. The currents are variable and uncertain. Velocities of 3 to 3½ knots have been observed between Blunts Reef and Swiftsure Bank, and velocities in excess of these amounts have been reported. Because of the possibility of a strong onshore set, especially in SW weather, vessels should not shoal the depths to less than 20 fathoms unless sure of the position.

(92) The bar channel is subject to change. Deep-draft vessels should not enter without knowledge of conditions at the time of entering. The deepest water is not always on the range. Information concerning conditions on the bar can be obtained from the Grays Harbor Pilots Association or from the Coast Guard on VHF-FM channel 16. The bar channel and harbor should not be attempted in thick weather.

(93) **Pilotage, Grays Harbor.**—Pilotage is compulsory for all foreign vessels, and U.S. vessels under enrollment and registered in foreign trade.

(94) Grays Harbor Bar Pilots serve Grays Harbor, Chehalis River, and Willapa Bay, and maintains an office at Aberdeen, WA, and a station at Westhaven Cove, Westport, WA.

(95) The office address is: Grays Harbor Bar Pilots, P.O. Box 123, Aberdeen, WA 98520; telephone 360-532-2761; Fax 360-532-6932.

(96) The station and pilot boats monitor VHF-FM channels 12 and 16, and use 12 as a working channel. The pilot boats, CHEHALIS and GRAYS HARBOR, are 65 and 60 feet long, respectively, and each has an orange and green hull. The word "PILOT" is displayed on both sides of each boat, and the standard day and night signals are used when vessels are approaching from seaward.

(97) Arrangements for pilots can be made by ships' agents by telephone or radiotelephone. A 24-hour advance notice of arrival is requested; any change in the estimated time of arrival requires a 4-hour advance notice to the pilots via the Marine Exchange, Seattle, Washington or radiotelephone.

(98) Pilots board vessels near Grays Harbor Approach Lighted Whistle Buoy GH (46°51.9'N., 124°14.3'W.). To assist pilots in boarding from the bow of the pilot boat, the ship is requested to maintain a speed of 6 knots. A pilot ladder should be rigged amidships on the leeward side clear of the gangway or other obstructions, and about 3 meters above the water with no manropes. In rough weather, pilots may board during daylight.

(99) **Westhaven Cove**, on the inner side of the N tip of Point Chehalis, is protected by breakwaters marked by lights. The harbor is a large sport and commercial fishing center operated by the Port of Grays Harbor.

(100) In October 1996, the controlling depth in the N entrance was 12 feet. In February 1998, the controlling depth in the S entrance was 11 feet; lesser depths are near the channel edges and breakwaters at both entrances. In February 1998, depths of 9 to 16 feet were available in the cove; much lesser depths are near the breakwaters and shores.

(101) **Grays Harbor Coast Guard Station** is on the S side of Westhaven Cove. The town of **Westport**, a summer resort and fishing town, is about a mile S of Westhaven Cove.

(102) Westhaven Cove has about 1,000 berths, with electricity, about 20 transient berths, gasoline, diesel fuel, water, ice, a launching ramp, pump-out facilities, and marine supplies. Dry winter boat storage is available in the cove. A boatyard at the S end of the harbor has a mobile lift that can handle craft to 60 tons for hull or engine repairs; the yard includes a ship chandlery. Electronic repair service is available at the harbor. The Grays Harbor pilot boat is berthed at Westhaven Cove.

(103) The Coast Guard has established Grays Harbor Entrance Small Boat Warning Sign, a **rough bar advisory sign**, 20 feet above the water, visible from the channel looking seaward, on the N side of Westhaven Cove, to promote safety for small-boat operators. The sign is diamond shaped, painted white with an international orange border, and with the words "Rough Bar" in black letters. The sign is equipped with a seasonal alternating quick flashing yellow light. The light will be activated when seas exceed 4 feet in height and are considered hazardous for small boats. Boaters are cautioned, however, that if the light is not flashing, it is no guarantee that sea conditions are favorable.

(104) The Coast Guard displays **heavy weather warning flags**, square RED flags with square BLACK centers, at two locations in Grays Harbor; one flag is on the Coast Guard lookout tower 70 feet above the water on the S side of Point Chehalis and the other is on the NW side of the Coast Guard station boat house 50 feet above the water. These displays will be based on current weather warnings issued in the following National Weather Service forecast areas; Cape Flattery to Cape Shoalwater. Display of flags are required from one hour before sunrise to one hour after sunset. Weather flags are flown at select Coast Guard stations to supplement other weather notification sources. Light signals corresponding to these flags are not displayed at night. In all cases mariners should rely upon National Weather Service broadcasts as their primary source of government provided weather information.

(105) **Bay City**, 3.7 miles SE from Westhaven Cove, on the E shore of **South Bay** formerly was a whaling station. The wharf, built originally for the old fertilizer factory, is now in ruins, and there are no marine facilities now at Bay City. The fixed highway bridge at Bay City has a clearance of 39 feet.

(106) For the rest of the 2.6-mile distance, South Bay is crooked and full of shoals to the mouth of **Elk River**, which is used some for logging.

(107) **Markham**, site of a large cranberry plant and a small seafood company, is on the S side of the bay at the mouth of **Johns River**, a shallow stream crossed by a fixed highway bridge with clearance of 33 feet, near the entrance. Above the bridge, the stream is navigable only for rowboats.

(108) **Hoquiam** and **Aberdeen** are twin cities about 14 miles above the harbor entrance. Hoquiam is on the river of that name, and Aberdeen is on Chehalis River. South Aberdeen is across the river, but is part of the city of Aberdeen.

(109) **Cosmopolis** is a small town on the S side of Chehalis River just above South Aberdeen. There is a large pulpmill here.

(110) **Chehalis River** enters at the E end of Grays Harbor and is marked by lights to Cosmopolis. It is navigable by small boats to **Elma**, 24 miles above the mouth. The upper portion of the river, for a distance of about 45 miles above Elma, is used for floating logs.

(111) **Montesano**, about 14 miles above Aberdeen, has several mills. This stretch of the river is used only by log tows and outboard motorboats. A small-boat moorage is on the N bank between the highway and railroad bridges S of Montesano. A launching ramp is near the moorage.

(112) **Towage**.—Tugs up to 2,200 hp are available at Hoquiam. Arrangements for a tug should be made in advance either through the Grays Harbor Pilots Association or ships' agents. Tugs monitor and use as working frequency VHF-FM channel 9.

(113) **Bridges**.—The main channel of Chehalis River is crossed by U.S. Route 101 highway drawbridge at Aberdeen, about 1.4 miles above Cow Point. The bridge has a clearance of 35 feet. The bridgetender of the highway bridge monitors VHF-FM channel 16 and works on channel 13; call sign KJA-289. (See **117.1 through 117.59 and 117.1031**, chapter 2, for drawbridge regulations.) A fixed bridge with a clearance of 29 feet is at South Montesano.

(114) In the 6-mile stretch between Montesano and Elma there are three fixed bridges having least clearance of 8 feet. At Cosmopolis, 5.5 miles above the mouth, is a power cable with a clearance of 125 feet. Between this point and Montesano the least clearance of power cables is 54 feet.

(115) The Hoquiam River is crossed by a railroad swing bridge, the Simpson Avenue/U.S. Route 101 bascule bridge, and the 6th Avenue lift bridge within 0.7 mile of the mouth. Least clearances are: 11 feet for the swing bridge; 25 feet for the bascule bridge; and 4 feet down and 65 feet up for the lift bridge. The railroad swing bridge about 2 miles above the mouth has a clearance of 5 feet. Overhead power and television cables with clearances of 54 feet cross the river about 1 mile above the mouth. A power cable across the N draw of the railroad swing bridge 2 miles above the mouth has a clearance of 43 feet; the power cable just above the bridge has a clearance of 75 feet.

(116) The Wishkah River is crossed by two swing bridges and one bascule bridge within 0.4 mile of the mouth; least clearance is 8 feet. A fixed bridge about 1 mile above the mouth has a clearance of 16 feet. The least clearance of overhead power cables close below and above this fixed bridge is 30 feet. (See **117.1 through 117.59, 117.1031, 117.1047, and 117.1065**, chapter 2, for drawbridge regulations for bridges crossing the Chehalis, Hoquiam, and Wishkah Rivers.)

(117) **Quarantine, customs, immigration, and agricultural quarantine**.—(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(118) Aberdeen is a **customs port of entry**.

(119) **Quarantine** is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1, for details.)

(120) **Harbor regulations**.—The Port of Grays Harbor Commission appoints a port manager who directs the facilities and port affairs of the harbor district, which is coextensive with Grays Harbor County. The Port of Grays Harbor general offices are at 111 South Wooding Street, about 500 yards from the inshore end of Terminal Pier 1.

(121) **Wharves**.—The Port of Grays Harbor operates three marine terminals. In addition to the port-operated facilities described, there are more than seven private deep-draft piers and wharves in the Hoquiam, Aberdeen, and Cosmopolis area. Only the major deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 35, published and sold by the U.S. Army Corps of Engineers. (See ap-

pendix for address.) The alongside depths are reported. (For information on the latest depths contact the port authorities or the private operators.)

(122) **Port of Grays Harbor facilities:**

(123) Terminal 2 (46°57'53"N., 123°51'10"W.): 700 feet of berthing space with dolphins; 35 feet alongside; deck height, 18 feet; 50,000 square feet of covered storage; 27 acres open storage; receipt and shipment of general cargo, including woodpulp, lumber, and logs.

(124) Terminal 4 (46°57'40"N., 123°50'14"W.): 1,400-foot berthing space; 30 to 37 feet alongside; deck height, 18 feet; 107 acres of open storage; two 50-ton gantry cranes travel the entire length of the wharf, one 40-ton high-speed container crane, one 60-ton bridge crane, at the W end of the wharf, is equipped with a 50-ton log grapple; 15 log-handling machines with capacities to 45 tons; receipt and shipment of logs and containerized general cargo.

(125) **Private facilities:**

(126) ITT Rayonier North Channel Wharf (46°58'12"N., 123°54'40"W.): 600-foot face; 875 feet of berthing space with dolphins; 35 feet alongside; deck height, 20 feet; shipment of logs and lumber; owned and operated by ITT Rayonier, Inc.

(127) Weyerhaeuser Aberdeen Saw Mill Wharf (46°58'27"N., 123°47'57"W.): 900-foot berthing space; 33 to 35 feet alongside; deck height, 16 feet; one stiff-legged derrick for loading chips; 24 acres open storage; shipment of chips and lumber; owned and operated by Weyerhaeuser Co.

(128) Roderick Timber Co. Wharf (46°58'21"N., 123°46'39"W.): 500-foot face; 785 feet of berthing space with dolphins; 32 to 35 feet alongside; deck height, 19½ feet; 35 acres open storage; shipment of logs; owned and operated by Roderick Timber Co.

(129) Weyerhaeuser Log Export Dock No. 2 (46°58'18"N., 123°46'48"W.): 450 feet of berthing space; 34 feet alongside; shipment of logs; owned and operated by Weyerhaeuser Co.

(130) Weyerhaeuser Log Export Dock No. 1: immediately S of Dock No. 2; 430-foot face; 600 feet of berthing space with dolphins; 34 feet alongside; deck height, 16 feet; 27 acres open storage; shipment of logs; owned and operated by Weyerhaeuser Co.

(131) **Supplies.**—Bunker fuel, diesel oil, lubricants, water, and some marine supplies are available for large vessels at Grays Harbor. Complete service and repair facilities for small craft are available at Westhaven Cove, Aberdeen, and Hoquiam.

(132) **Repairs.**—There are no facilities for major repairs to large oceangoing vessels in Grays Harbor; the nearest such facilities are in Portland, Oreg. There are several marine railways in Grays Harbor, the largest of which is at a shipyard on the W bank of the Hoquiam River 1 mile above its mouth. This railway can handle vessels to 400 tons, 80 feet long or 34 feet wide for hull repairs. Machine shops and foundries are nearby and can make some engine repairs. Electronic repair service is available.

(133) **Communications.**—Grays Harbor is served by the Burlington Northern Railroad and the Union Pacific Railroad. Two U.S. highways serve Aberdeen and Hoquiam. Bowerman Airport, owned and operated by the Port of Grays Harbor, is on an extensive filled area just W of Hoquiam; there are flights to Seattle, Portland, Astoria, and points beyond.

(134) **North Bay**, immediately E of Point Brown, is a shallow bight about 6 miles long. It is filled with shoals and flats that bare at low water. There is some oyster culture in the bay, which is used considerably by small oyster boats. The entrance to the bay is marked by buoys.

(135) **Hoquiam River** empties into Grays Harbor about 2 miles W of the mouth of Chehalis River. It is practically a tidal slough 11 miles long. In November 1980, the midchannel controlling depth was 6 feet from the mouth of Hoquiam River to the junction of the Hoquiam River and the East Fork of the Hoquiam River, a distance of about 2.5 miles. Traffic on the river consists of log tows, tugs, and other small craft. Between the mouth of the river and its junction with the East Fork, the river is crossed by a bascule bridge and 2 swing bridges with least clearances of 5 feet and by a lift bridge with clearances of 4 feet down and 65 feet up. Overhead power and TV cables crossing the river have a least clearance of 43 feet. (See 117.1 through 117.59 and 117.1047, chapter 2, for drawbridge regulations.)

(136) In May 1985, a sunken wreck marked by a buoy was reported about 280 yards N of the lift bridge in about 46°58'55"N., 123°53'00"W.

(137) **Wishkah River** empties into the N side of Chehalis River in the E part of Aberdeen. It is little used.

(138) **Chart 18500.**—From Point Brown the coast extends N for 23 miles to Point Grenville as a low, sandy beach, broken occasionally by small streams and in some places by bluffs. A few small towns and settlements, connected by roads or trails, are scattered along this stretch.

(139) **Copalis Head**, 13 miles N of Point Brown, is a bright yellow bluff 2 miles long and 200 feet high. It is 1.5 miles N of **Copalis River**. **Copalis Rocks**, two small rocks the larger 34 feet high, lie 500 yards off the head, and a rock awash is about 0.5 mile WSW of the head.

(140) Two small bluffs mark the mouth of **Joe Creek**, 3.5 miles N of Copalis Head.

(141) **Moclips River** entrance is 6 miles N of Copalis Head. The S point at the mouth is bare and sandy; on the N bank is a bright yellowish bluff 50 feet high. **Moclips**, near the mouth of this river, is connected by a branch of the Burlington Northern Railroad with Hoquiam on the N shore of Grays Harbor. A triangular-shaped yellowish bluff about 110 feet high on the S bank of **Wreck Creek**, which empties about 2.5 miles N of Moclips, is prominent from offshore.

(142) **Point Grenville**, 10 miles N of Copalis Head, is a broken rocky promontory with nearly vertical whitish cliffs over 100 feet high. Numerous rocks extend for some distance off the point. **Grenville Arch**, dark in color, 83 feet high, is the outer and more prominent of two rocks lying W of the point; it is over 0.5 mile SW of the inner extremity of the point. The arch lies E and W. A rock that uncovers is 400 yards NW of Grenville Arch. The W rock, off the W end of the point, is 200 yards off the cliff and 92 feet high. There are several rocks inside of it, but none outside. Two rocks, over 90 feet high, are 400 yards S of the S extremity of the point.

(143) An indifferent anchorage in NW weather may be had under Point Grenville by vessels of moderate draft, but the depths compel anchoring at such a distance from the beach that little shelter is afforded. The anchorage is in 4 fathoms, sandy bottom, with the inner extremity of the point bearing 338°, and Grenville Arch bearing 239°. This anchorage is not recommended for ordinary use.

(144) N of Point Grenville is a series of cliffs; the upper part appears light gray, the lower part dark, separated by a well-defined line of demarcation. This formation disappears near the S end of the cliffs where they are broken up and present a stratified appearance. The strata slope downward to the N. North of the cliffs

is a shingle beach followed by irregular bluffs and cliffs terminating near Taholah in white cliffs of uniform height, which from offshore do not present the stratified appearance noticeable to the S.

(145) **Quinault River** breaks through the cliffs about a mile SE of Cape Elizabeth. **Taholah** is an Indian village on the banks of the river. The shoreline in this section is low. The river is navigable only by skiffs and outboard motorboats. Some gasoline and supplies are available. A piling dike has been built along the spit in front of the village. In the background is a ridge with three long, flat summits. The road serving the beach settlements, and connecting them with Hoquiam, terminates at Taholah.

(146) From Taholah to Cape Elizabeth the cliffs present an almost unbroken face seaward and in places are about 200 feet high. They appear either white or bright yellow, and from offshore present a very noticeable stratification, sloping downward to the S; an important difference from the direction of slope around Point Grenville.

(147) **Sonora Reef** extends SSE from Cape Elizabeth for over 2 miles, its S end lying 1.1 miles offshore.

(148) **Cape Elizabeth** projects about a mile from the general trend of the coast, and when seen from seaward appears as a bright yellow, rocky cliff reaching in places a height of 200 feet. There are no high or large rocks off the cape. A little less than a mile SSE and SSW, lie two rocks awash, and inside of these, less than 0.5 mile from the extremity of the cape, are some small visible rocks that break. The houses of the Quinault Indian Reservation are at the E end of the cliffs.

(149) From Cape Elizabeth for 20 miles to Destruction Island, the coast is nearly straight, with low shores and rocky cliffs heavily wooded to the edges. Numerous rocks lie offshore, but these are inshore of the usual track of vessels.

(150) **Flat Rock**, low and black, is 1.6 miles NW from Cape Elizabeth and 0.9 mile offshore. A covered rock which breaks in ordinary weather is 400 yards S of it. A small rock is halfway between Flat Rock and Cape Elizabeth, with a smaller one inside halfway to the beach.

(151) **Pratt Cliff**, 3 miles N of Cape Elizabeth, is a sharp point backed by cliffs, 139 feet high. **Split Rock**, 70 feet high, is 1 mile offshore, abreast of the N end of Pratt Cliff. It is split in two, and the division shows when seen from W to NW. A small, low, black rock is 0.5 mile S of it, and a larger one is 0.4 mile S of Split Rock.

(152) **Willoughby Rock**, 120 feet high, 0.4 mile NE of Split Rock, is nearly round with an abrupt seaward face. A cluster of rocks is between Willoughby and Split Rock and a little S of them; one is black and conical, with a rock awash 200 yards SW from it.

(153) **Sealion Rock**, 8 feet high, small and black, is 3 miles NW of Split Rock and 2.6 miles offshore.

(154) From Pratt Cliff to **Raft River**, 3.5 miles, the coast consists of broken cliffs over 100 feet high bordered by rocks extending over 0.5 mile offshore. Midway between these points are three rocky heads covered with trees to the edges projecting beyond the cliffs and almost detached from them.

(155) **Tunnel Island**, 157 feet high, is in the entrance to Raft River, and at low water is connected with the S point of the river. A vertical pillar, 108 feet high, stands 150 yards NNW of the rock, and a cluster of rocks is close-to under its SE point.

(156) From Raft River to Queets River, 4.5 miles, the coast consists of cliffs about 80 feet high, broken occasionally by small streams.

(157) **Queets River** is the largest stream between Grays Harbor and Cape Flattery. The S point is a low, sandy spit about 0.1 mile long, projecting from an abrupt cliff, 80 feet high, and densely wooded. The N point is 1.3 miles long, low, and sandy, with some trees at the mouth of the river, and a narrow lagoon between it and the bluff.

(158) From Queets River for 10 miles to abreast Destruction Island, the coast is rather low and is broken by cliffs about 50 feet high with broad low-water beaches. **Kalaloch Rocks** are about 4.5 miles N of the river, close inshore.

(159) A **U.S. Navy Underwater Tracking Range** is W of the mouth of Queets River, about 6 to 10 miles offshore. Underwater cables, several feet above the ocean bottom and over an area about 1 mile wide, extend NE from the upper E side of the tracking range, at about 47°32.5'N., 124°30'W., to the shore at about 47°36.3'N., 124°22.5'W. Mariners are cautioned against anchoring or dragging in these areas.

(160) **Destruction Island**, 90 feet high, is 20 miles NNW of Cape Elizabeth and 3 miles offshore. It is flat-topped and covered with brush, with a few clumps of trees. The island is 0.5 mile long and 300 yards wide at its S part. From the N end rocks and ledges extend about a mile from the cliffs; these are bordered by a line of kelp on the inshore side.

(161) **Destruction Island Light** (47°40.5'N., 124°29.2'W.), 147 feet above the water, is shown from a 94-foot white conical tower with black gallery on the SW part of the island; a fog signal is at the light.

(162) An indifferent anchorage, affording shelter from NW winds, may be had off the SE face of the island in 10 fathoms, sandy bottom, with the light bearing between 293° and 315°. Vessels must leave if the wind hauls W or S. During the fishing season many small fishing boats anchor for the night under Destruction Island; it is the only shelter from offshore winds between Grays Harbor and Cape Flattery.

(163) **Chart 18480.**—For 5.5 miles from Destruction Island to Hoh Head, the coast trends in a general NW direction. The cliffs are 50 to 100 feet high, and many rocks and ledges extend 1.2 miles offshore in some places.

(164) **Abbey Islet**, 3.5 miles NE of Destruction Island, is over 100 feet high and covered with trees. It is 200 yards off the cliffs. Many rocks are close S of it, the most distant of which is **South Rock**, 46 feet high, 1 mile S, and 0.5 mile offshore.

(165) At the mouth of **Hoh River**, 2 miles SE of Hoh Head, is a broad sand beach; the absence of cliffs for 0.5 mile is noticeable for a considerable distance offshore. In smooth weather the river can be entered by canoes, but the channel shifts. An Indian village is on the S bank at its mouth.

(166) **Hoh Head**, 200 feet high, is a bright yellow cliff covered with a dense forest. It projects a little over 0.5 mile from the general trend of the coast. A large cluster of rocks is off the S cliff of the head and covered rocks extend to about 1.6 miles offshore between the head and North Rock. A rock covered 2¼ fathoms lies 1.8 miles WNW of Hoh Head.

(167) **Middle Rock**, **North Rock**, and **Perkins Reef** are other dangers within 1.5 miles off Hoh Head. Middle Rock, 65 feet high and black with vertical sides, is 0.8 mile off the mouth of Hoh River. North Rock, a mile S of Hoh Head, is 107 feet high

and grayish in color, with steep sides; in the afternoon sun this rock shows white, which makes it a very distinct landmark. Perkins Reef is a long, bold, and jagged islet, 1.1 miles W of Hoh Head. This area has numerous other rocks, covered and bare.

(168) The coast continues rugged and rocky from Hoh Head to La Push, 11 miles to the NW. The cliffs are 100 to 120 feet high, broken here and there by small streams. Several rocky islets 25 to 120 feet high and covered ledges extend in some places as much as 2 miles offshore.

(169) **Alexander Island**, 121 feet high, is 2 miles NNW of Hoh Head and 1 mile offshore. It is covered with low vegetation, and is flat-topped with steep sides. The island is prominent in hazy or smoky weather. A small clump of trees in its center makes it easily distinguishable from the other rocks and islands in the area. A covered rock, 1.8 miles WNW of Alexander Island, is the outermost known danger in this vicinity.

(170) **Toleak Point**, 4.7 miles NW of Hoh Head, is a narrow point terminating in a small knob with an abrupt seaward face. A high wooded islet lies 400 yards W of the point, to which it is connected by an extensive bare reef. **Rounded Islet**, a grassy rock 130 feet high with rounded top and steep sides, is 0.3 mile seaward of Toleak Point. A low black rock is 0.7 mile S of the islet.

(171) **Giants Graveyard**, 1.5 miles N of Toleak Point, consists of very irregular rocks; the largest are up to 210 feet high. The farthest offlying rock is about 0.8 mile from shore.

(172) **Teahwhit Head**, 8 miles NW of Hoh Head and 2.4 miles SSE of La Push, is a jagged double point 100 feet high and heavily wooded. **Strawberry Bay**, on the SE side of the head, is a small bight in which fishing boats find shelter from NW winds. There are numerous rocks in and around the bight.

(173) **Quillayute Needle**, 81-foot high pinnacle, 1.3 miles WNW of Teahwhit Head, is the outermost of many rocks, visible or covered, that are within a mile of the shore. Some are as high as 100 to 195 feet, and many are awash or covered by a fathom or less. The foul area continues to within 1 mile S of James Island, at the entrance to La Push.

(174) **James Island**, 15 miles NNW of Destruction Island on the N side of Quillayute River mouth, is 183 feet high, bold and wooded, and joined to the beach at low water. Numerous smaller wooded islands, immediately N, are prominent. An indifferent anchorage affording some shelter from NW winds may be had close SE of James Island, in 5 to 6 fathoms, sandy bottom, about 600 yards from the beach. Sea swell makes this anchorage unsafe.

(175) **James Island Light** (47°54.3'N., 124°38.8'W.), 150 feet above the water, is shown from a white house on the S part of the Island. A fog signal is at the light.

(176) **La Push**, an Indian village on the E bank and about 0.4 mile above the entrance of **Quillayute River**, is an important sport fishing center.

(177) The river channel is protected by a jetty on the SE side and a dike on the NW side; a lighted whistle buoy is about 1.8 miles SW from the outer end of the jetty. About 250 feet of the outer end of the jetty is awash at high water.

(178) **COLREGS Demarcation Lines**.—The lines established for the Quillayute River are described in **80.1380**, chapter 2.

(179) The river channel leads from the sea to a small-craft basin at La Push. The entrance channel is marked by a directional light. The channel to the basin is marked by a light and seasonal buoys. Buoys are not charted because they are frequently shifted in posi-

tion; local knowledge is advised. In March 2002, depths of 7 to 10 feet were in the basin, except for lesser depths along the W jetty and in the NW corner. The N and S sides of the entrance to the basin are marked by lights. A power cable with a clearance of about 100 feet crosses the river near its mouth.

(180) The channel, which passes close to the SE shore of James Island, is sometimes dangerous, especially in heavy S weather. Weather conditions which make the entrance hazardous normally occur only in the winters, usually in December and January. When there are breakers of any size making across the entrance, it should not be attempted except at better than half tide and with a well-powered boat. Strangers may request assistance from the **Quillayute River Coast Guard Station** at La Push by radio or signals; a Coast Guard boat will lead the vessel in if practicable. The tank at the Coast Guard station is prominent.

(181) In late summer and fall mariners are advised to use caution when transiting the channel because fish nets may be present.

(182) **Weather, Quillayute, Tatoosh Island, and vicinity**.—Maritime air from over the Pacific has an influence on the climate throughout the year. In the late fall and winter, the low-pressure center in the Gulf of Alaska intensifies and is of major importance in controlling weather systems entering the Pacific Northwest. At this season of the year, storm systems crossing the Pacific follow a more S path striking the coast at frequent intervals. The prevailing flow of air is from the SW and W. Air reaching this area is moist and near the temperature of the ocean water along the coast which ranges from 45°F (7.5°C) in February to 57°F (13.9°C) in August. The wet season begins in late September to October. From October through January, rain may be expected on about 22 days per month; from February through March, on 21 days; from April to June, on 20 days; and from July to September, on 15 days. Precipitation falls an average of 239 days each year.

(183) As the weather systems move inland, rainfall is usually of moderate intensity and continuous, rather than heavy downpours for brief periods. Gale force winds are not unusual. Most of the winter precipitation over the coastal plains falls as rain; however, snow can be expected each year. Snow is seldom deeper than 10 inches (254 mm) or remains on the ground longer than 2 weeks. The average annual snowfall is only 13 inches (330 mm) but snow has fallen during every month except June, July, and August. Annual precipitation increases from about 90 inches (2286 mm) near the coast, to more than 120 inches (3048 mm) over the coastal plains, to 200 inches or more (>5080 mm) on the wettest slopes of the Olympic Mountains. The average annual precipitation at Quillayute airport is nearly 102 inches (2591 mm). December is the wettest month averaging nearly 15 inches (381 mm) and July is the driest with an average of only 2.37 inches (61 mm).

(184) During the rainy season, temperatures show little diurnal or day to day change. Maximums are in the forties (5.0° to 9.4°C) or minimums in the mid-thirties (0.6° to 2.8°C). A few brief outbreaks of cold air from the interior of Canada can be expected each winter. Clear, dry, cold weather generally prevails during periods of east winds. Maximum temperatures range from 25°F (-3.9°C) to 35°F (1.7°C) and minimums from 10° to 25°F (-12.2° to -3.9°C). The coolest temperature on record is 5°F (-15°C) recorded November 1985. Every month except June, July, and August has seen below freezing (<0°C) temperatures.

(185) In the late spring and summer, a clockwise circulation of air around the large high-pressure center over the North Pacific brings a prevailing northwest and west flow of cool, comparatively dry, stable air into the northwest Olympic Peninsula. The dry season begins in May with the driest period between mid-July and mid-August. The total rainfall for July is less than 0.5 of an inch (13 mm) in 1 summer out of 10; also, it exceeds 5.0 inches (127 mm) in 1 summer out of 10. During the warmest months, afternoon temperatures are in the upper sixties and lower seventies (20.0° to 22.2°C), reaching the upper seventies and the lower eighties (25.6° to 27.8°C) on a few days. Occasionally, hot, dry air from the east of the Cascade Mountains reaches this area and maximum temperatures are in the mid- or upper-nineties (34° to 38°C) for 1 to 3 days. Minimum temperatures are in the upper forties and the lower fifties (8.9° to 11.1°C). The lowest relative humidity and greatest danger of forest fires occur with east winds. The warmest temperature on record is 99°F (37°C) recorded in August 1981. Each month, May through September, has recorded temperatures in excess of 90°F (32.2°C).

(186) In summer and early fall, fog or low clouds form over the ocean and frequently move inland at night, but generally disappear by midday. In winter, under the influence of a surface high-pressure system, centered off the coast, fog, low clouds, and drizzle occur daily as long as this type of pressure pattern continues. An average of 236 days each year has fog. It is fairly evenly distributed throughout the year but the months of October through January have a slightly greater occurrence. The average frost-free season is from the last of April until mid-October.

(187) See page T-9 for Quillayute **climatological table**.

(188) In the vicinity of **Tatoosh Island** (see Tatoosh Island further on, this chapter), gales occur frequently with December and January being the favored months. Rainfall is moderate averaging nearly 80 inches (2032 mm) each year. December is the rainiest month followed closely by January and February. July is the driest. An average of 251 days each year record measurable precipitation. Snowfall is light due to the extreme maritime influence and averages only 13.5 inches (343 mm) each year. It is most likely in January. The daily range in temperature is narrow, seldom exceeding ten degrees (-12.2°C). The average temperature on Tatoosh Island is 49°F (9°C). The average maximum is 53°F (11.7°) while the average minimum is 45°F (7.2°C). January is the coolest month and August the warmest. Extremes on Tatoosh Island include an extreme maximum temperature of 82°F (27.8°C) recorded in June 1955 and an extreme minimum of 14°F (-10° C) recorded in January 1950 and December 1964.

(189) The Coast Guard has established Quillayute River Entrance Small Boat Warning Sign, a **rough bar advisory sign**, 34 feet above the water, visible from the channel looking seaward, on the NW corner of the old Coast Guard boathouse, to promote safety for small-boat operators. The sign is diamond shaped, painted white with an international orange border, and with the words "**Rough Bar**" in black letters. The sign is equipped with two alternating flashing amber lights. The lights will be activated when seas exceed 4 feet in height and are considered hazardous for small boats. Boatmen are cautioned, however, that if the lights are not flashing, it is no guarantee that sea conditions are favorable.

(190) About 96 berths, electricity, gasoline, diesel fuel, water, ice, a launching ramp, and some marine supplies are available at the basin at La Push. A good highway connects La Push with U. S. Highway 101 N of Forks.

(191) From James Island NNW for 16.4 miles to Cape Alava, the rugged coast continues, with rocks and foul ground extending as much as 2 miles offshore; the land side consists of steep wooded bluffs and narrow beaches. The cliffs, however, are not continuous. The once densely timbered country ascends gradually E to the snow-capped mountains of the Olympic Range, which can be seen for many miles in clear weather. In 1974, areas of heavy logging activity were in evidence inland for many miles from this coastal area.

(192) **Cake Rock**, 116 feet high, is 2 miles NW of James Island and 1.5 miles offshore. This rock, about 200 yards long, has steep sides and its flat top is surmounted by a 20-foot mound. There are several other visible rocks between Cake Rock and the shore.

(193) **Cape Johnson**, small and not particularly prominent, projects less than 0.5 mile from the coastline, terminating in a vertical cliff 100 feet high.

(194) **Sea Lion Rock**, 78 feet high, 2.6 miles NW of Cape Johnson, is large, brown, covered with guano, and irregular in outline. A low black rock is 200 yards E of Sea Lion Rock. **Carroll Island**, 225 feet high, is 0.8 mile N of Sea Lion Rock. It has vertical whitish sides and a grassy top. A pillar rock, 134 feet high, lies 200 yards W, and a low black rock is 200 yards off the SE side. Carroll Island and the pillar rock are quite prominent, especially in the sunlight.

(195) **Jagged Island** is the larger of two high bare rocks, inside of Sea Lion Rock and Carroll Island, about 0.8 mile offshore. It is 320 feet high with steep sides. The smaller rock is 183 feet high. They are 200 yards apart, and between them are two pinnacle rocks close together. Many other rocks are shoreward of the island.

(196) **Hand Rock**, 33 feet high, is 1.5 miles N of Carroll Island and 1.5 miles offshore. So named from its shape, the rock is black with a white cap of guano on top. A larger rock lies 0.5 mile toward shore and is sometimes mistaken for Hand Rock.

(197) **White Rock**, 161 feet high, 1.7 miles S of Cape Alava and about 0.8 mile offshore, has nearly vertical sides and a rounded top; it is whitish, and in the sunlight is visible for a long distance. A group of large, low, black rocks lie 0.8 mile SSE of White Rock and 0.8 mile offshore. A rock covered 6 fathoms is 2.2 miles W of White Rock.

(198) **Charts 18485, 18460.—Cape Alava**, the westernmost point of the State of Washington, is 13 miles S of Cape Flattery. The seaward face is about 0.6 mile in extent. **Tskawahyah Island**, a steep rocky island, 142 feet high and with trees on top, is off its NW extremity. The shore is bordered by numerous rocks and covered ledges.

(199) This stretch of shoreline is associated with the year-round operation of the Ozette Archaeological Expedition which was established at an abandoned Indian village site on Cape Alava in 1970.

(200) **Flattery Rocks** and Umatilla Reef are rocks and islets extending W from Cape Alava for 2.3 miles. **Ozette Island**, 236 feet high, is 0.8 mile SW of the cape. The island, 0.5 mile long, is flat-topped with steep sides. About 0.3 mile off the S and SE sides are low, black rocks. **Bodelteh Islands**, 1.2 miles WNW of the N end of Cape Alava, have high bold seaward faces. The outer one is 198 feet high.

(201) In season, a few fishermen find shelter in an anchorage off the SE end of Ozette Island. The area is small and requires local

knowledge to enter. It affords fair protection from the prevailing NW wind.

(202) **Umatilla Reef**, 2.3 miles NW of Cape Alava, the greatest danger to navigation off this section of the coast, is 0.7 mile W of the outer Bodelteh Island. It extends for 200 yards in a W direction and is about 75 yards wide. The reef consists of small, low, black rocks and some breakers. There is a reported breaker 1.1 miles NNE of this reef, and a rock covered 3 feet, 0.3 mile E of the reef, which endangers the passage inside Umatilla Reef, sometimes used by small boats. Umatilla Reef is difficult to make out, especially in thick weather. A lighted whistle buoy is about 1.5 miles W of the reef.

(203) Between Cape Alava and Cape Flattery, the coast curves slightly in a series of bights, but continues as rugged as before. There are alternate stretches of wooded bluffs and high rocky cliffs. The country immediately back of the beach is not high, but it is densely wooded.

(204) **Point of Arches**, 5 miles NNE of Cape Alava, is the N point of the cliffs that extend some 1.5 miles S. Numerous rocks and ledges are offshore as far as about a mile.

(205) **Father and Son**, two rocks connected by a low reef, lie 0.6 mile offshore abreast the S end of the cliffs. The outer rock is 167 feet high, and the inner one 65 feet high. From the outer rock to Spike Rock there are several exposed rocks.

(206) **Spike Rock**, 35 feet high, sharp and bare, is 0.8 mile NW of the Point of Arches. It is the outermost of a chain of rocks, the largest of which is 185 feet high; there are three arches in these rocks. A rock that uncovers 5 feet is 0.3 mile WSW of Spike Rock.

(207) **Portage Head**, 2.5 miles N of Point of Arches, has a mile-long seaward face of bold irregular cliffs over 410 feet high. **Anderson Point**, at the N end of the cliffs, has a height of about 270 feet. A reef extends from the point toward Cape Flattery for 1.5 miles showing several low, black rocks awash, and one small rock 45 feet high. A rock that uncovers is 1.3 miles NW of Portage Head. An aero radiobeacon is atop Cheeka Peak about 2.2 miles E of Anderson Point.

(208) **Makah Bay** is a shallow bight included between Portage Head and Waatch Point. It affords indifferent shelter in N and E weather and a smooth sea, but is little used. The shores are low and sandy. **Waatch River** enters in the N part of the bight immediately E of Waatch Point. It is a tidal slough, and the valley through which it runs extends about 2 miles to Neah Bay on the Strait of Juan de Fuca. This low depression is one of the features for recognizing Cape Flattery.

(209) **Waatch Point**, 3 miles SE of Cape Flattery, is the SE extremity of the cliffs extending to the cape. This stretch is bordered by numerous rocks and ledges.

(210) **Fuca Pillar**, 0.2 mile S of the W point of Cape Flattery, is a rocky column 157 feet high and 60 feet in diameter, leaning slightly NW. It is 150 yards off the face of the cliff, and is more prominent from N than from S.

(211) **Cape Flattery**, a bold, rocky head with cliffs 120 feet high, rises to nearly 1,500 feet about 2 miles back from the beach. From S it looks like an island because of the low land in the valley of Waatch River. Numerous rocks and reefs border the cliffs E and S of the cape. Tide rips are particularly heavy off Cape Flattery.

(212) A large radar dome, highest and most prominent structure in the area, is on **Bahokus Peak**, the part of Cape Flattery about 2 miles back from the beach that rises to nearly 1,500 feet. This in-

flated plastic dome, about 50 feet in diameter, is on top of a tower, and was reported to be a very good landmark over low dense fog for vessels coming from the S.

(213) **Tatoosh Island**, 0.4 mile NW of Cape Flattery, is about 0.2 mile in diameter, 108 feet high, flat-topped, and bare. It is the largest of the group of rocks and reefs making out about 0.9 mile NW from the cape. The passage between Tatoosh Island and the cape is dangerous and constricted by two rocks awash near its center. Although sometimes used by local small craft, it cannot be recommended. The currents are strong and treacherous. Breakers may be in the area, especially during maximum currents.

(214) (See page T-9 for **Tatoosh Island climatological table**.)

(215) **Cape Flattery Light** (48°23.5'N., 124°44.2'W.), 165 feet above the water, is shown from a 65-foot white conical tower on a sandstone dwelling on the W end of Tatoosh Island. A fog signal is at the light.

(216) A rocky patch, covered 7½ fathoms, on which the sea breaks occasionally in a W swell, is 1.4 miles SW of the light.

(217) **Duncan Rock** and **Duntze Rock**, the two principal dangers NNW of Tatoosh Island, are respectively, 1 mile and 1.3 miles from the light. Duncan Rock is small, low, and black; Duntze Rock is covered 3¼ fathoms. A lighted whistle buoy is 500 yards NW of Duntze Rock. Ledges and rocks constrict the passage between Duncan Rock and Tatoosh Island to less than 0.5 mile, and strong currents and tide rips make it hazardous.

(218) **Charts 18460, 18480.—Swiftsure Bank**, about 3.5 miles in extent, is off the mouth of the Strait of Juan de Fuca, NW of the submarine valley making into the strait. The bank has a least depth of 18 fathoms.

(219) During the summer, large numbers of fishing vessels may be trolling or at anchor on Swiftsure Bank. During periods of low visibility, which are not uncommon in this vicinity, extreme caution must be exercised to avoid collision with fishing boats; most of these craft tend to defy radar detection.

(220) U.S. Navy operating areas are SW of the entrance to the Strait of Juan de Fuca. Mariners should exercise caution when navigating in this vicinity while exercises are in progress.

(221) **Carmanah Point to Amphitrite Point, Canada**.—The coast from Carmanah Point to Cape Beale is very dangerous and, except during fine weather and offshore winds, should be given a wide berth.

(222) **Carmanah Point** is on the Vancouver Island shore, 13 miles N of Tatoosh Island. A light, 175 feet above the water, is shown from a white octagonal concrete tower on the point; a fog signal and radiobeacon are at the light.

(223) **Clo-oose**, an abandoned village, is 4 miles NW of Carmanah Point in the small cove at the mouth of the Cheewhat River, E of the entrance to Nitinat Lake.

(224) A reef 0.8 mile long in a NW direction, with a rock awash in its center, is off this cove. It is marked by a lighted whistle buoy 0.8 mile SW of the rock.

(225) **Tsusiak Lake** is 8.5 miles NW of Carmanah Light. At the seaward end of the lake is a conspicuous waterfall which is visible far off even in hazy weather, and may help fix a vessel's position as it is the only waterfall on this part of the coast. Behind Tsusiak Lake the mountains rise to more than 2,000 feet.

(226) **Pachena Point**, 25 miles NW of Cape Flattery, is marked by a light; a fog signal is at the light.

(227) **Seabird Rocks** are off the entrance to Pachena Bay, 3 miles NW of Pachena Point. The largest is about 48 feet high, bare, and of small extent; it is marked by a light. There is no safe passage between Seabird Rocks and the shores NE, and the rocks should not be approached closer than 1.5 miles.

(228) **Cape Beale** is a bold rocky point, 120 feet high. A reef with rocks above and below water extends about 0.8 mile SW from it. **Cape Beale Light** (48°47.2'N., 125°12.8'W.), 167 feet above the water, is shown from a white slatted daymark on a red square skeleton tower near the W extremity of the cape; a fog signal is at the light.

(229) **Barkley Sound**, an extensive arm of the sea 35 miles NW of Cape Flattery, lies between Cape Beale and Amphitrite Point. It is 15 miles wide at its entrance, and though encumbered by numerous islands and rocks, it maintains a breadth of 13 miles for 8 miles inland, above which it separates into several narrow inlets. The shores are low, except in the N part and among the inlets, where they become high, rugged, and mountainous.

(230) In the W part of the sound are innumerable rocks and islands with navigable channels between them. Entrance should not be attempted without local knowledge or a pilot. **Imperial Eagle Channel** is the easiest of access.

(231) **Amphitrite Point** is the W entrance point of Barkley Sound. A light, 58 feet above the water, is shown from a white rectangular tower on the end of the point; a fog signal is at the light. A whistle buoy is 0.6 mile S of the point.

(232) A more detailed description of Canadian waters is given in Pub. No. 154, *Sailing Directions (Enroute)* for British Columbia, published by the National Imagery and Mapping Agency, and the *Sailing Directions, British Columbia Coast, (South Portion)* Vol. I, published by the Canadian Hydrographic Service.

(233) **Routes.**—In clear weather no difficulty will be experienced in approaching the entrance to the Strait of Juan de Fuca from any direction, as the land on both sides is high and Cape Flattery is readily distinguished, particularly from S, owing to the low land between Makah and Neah Bays. Lights, fog signals, and radiobeacons are available on both sides of the strait to assist in obtaining a fix.

(234) In thick weather soundings will assist in estimating the distance from shore. Vessels should pick up the 100-fathom curve and be guided by the soundings. The relationship between the 100- and 50-fathom curve is a good indication for fixing the position; vessels should not proceed inside the 50-fathom curve until a fix has been obtained. The mountain peaks in the interior sometimes can be seen when the coast is obscured by fog.

(235) **Depths.**—The depths in the approaches to the Strait of Juan de Fuca are very irregular, especially outside the 50-fathom curve. There is a deep submarine valley with depths of over 100 fathoms and a width of 2 to 4 miles, between the 100-fathom curves, which leads from about 37 miles SSW of Cape Flattery, rounds this cape at a distance of 2 miles, and extends about 32 miles into the strait. The 100-fathom curve on the W side of this submarine valley is very irregular, but on the E side it is more regular. Within the strait the curve is regular on both sides of the valley.

(236) **Currents.**—The current on Swiftsure Bank is described in the Tidal Current Tables. Off the entrance of the Strait of Juan de Fuca the coastal current is influenced by the flow into and out of the strait. On the flood there is a set into all the sounds on the Vancouver Island shore, and this, combined with the prevailing NW current and light S winds, with possibly some swell from the same direction, makes the coast in the vicinity and W of

Carmanah Light dangerous, especially for small vessels. Many strandings have occurred on the Vancouver Island shore.

(237) The flood current entering the Strait of Juan de Fuca sets with considerable velocity over Duncan and Duntze Rocks, but instead of running in the direction of the channel there is a continued set toward the Vancouver Island shore, which is experienced as far as Race Rocks. The flood current also has more velocity on the N shore of the strait than on the S.

(238) The ebb current is felt most along the S shore of the strait, and between New Dungeness Light and Crescent Bay there is a decided set S and W, especially during large tides. With wind and swell against the current, a short choppy sea is raised near the entrance to the strait. (For additional information on currents in the Strait of Juan de Fuca, see chapter 12.)

(239) Sailing craft approaching the strait should keep well off the mainland coast S of Cape Flattery, unless working to windward against a fine N wind, which is frequently found during the summer. In this case the coast may be approached to within 3 miles. At other times there is no inducement to hug the coast, on which a long rolling swell frequently sets, and this swell, meeting the SE gales of winter, causes a confused sea. The cape and its offlying dangers should be given a berth of at least 3 miles, as the tidal current sometimes sets with great velocity toward Duncan and Duntze Rocks. It is equally necessary when entering or leaving the strait to avoid the coast of Vancouver Island between Port San Juan and Bonilla Point, when there is any appearance of bad weather.

(240) Sailing vessels making the strait during the winter, especially during November and December, and experiencing the E and SE winds prevalent at that season, should endeavor to hold a position S or SW of Cape Flattery, and should on no account open the entrance of the strait until an opportunity offers of getting well inside. It is also important to remember that, though it may be blowing strongly from the S or SSW outside, on rounding Cape Flattery, an E wind may be found blowing out of the strait, and a vessel would then find the Vancouver Island coast a dangerous lee shore.

(241) Coming from the W with a heavy W or NW gale and thick weather, vessels uncertain of their positions should lie-to on soundings at not less than 30 miles from the entrance or on the edge of the bank. These gales seldom last more than 12 hours, and if they veer toward the SW the weather will clear and vessels may bear up for the strait.

(242) **Fog.**—The fog is generally heavier near the entrance, decreasing in density and frequency up the strait. Near the entrance the fog sometimes stands like a wall, and vessels entering the strait run out of it into clear bright weather, even before passing Tatoosh Island. The fog frequently extends a long distance seaward. The wind gradually works the fog into the strait, and it will follow the N shore past Port San Juan to the Sombrio River; occasionally it will reach as far as Sooke Inlet and at times to Race Rocks. As a rule, however, the fog moves farther into the strait along the S shore, at times reaching Port Townsend; frequently the N shore is clear when the S shore is enveloped in fog.

(243) During the spring, fog is frequent in the strait. With the W wind it often stops at the headland between Crescent and Freshwater Bays, the fog then extending W while it is clear to E. When fog extends past Freshwater Bay the small area about the W bight will often be clear.

(244) **Weather, Strait of Juan de Fuca and vicinity.**—In summer, the prevailing NW winds draw into the strait, increasing toward evening and at times blowing 25 knots before midnight.

This occurs, however, only when the winds are strong outside. In light winds, sailing vessels may be a week from Cape Flattery to Admiralty Inlet, and vice versa.

(245) In winter, SE winds draw out of the strait, causing a confused cross-sea off the entrance, the heavy SW swell meeting that coming out. Under these conditions small outboard vessels, especially sail, often make Neah or Clallam Bays and await more favorable weather. The weather off the entrance as a rule is excep-

tionally severe, and wrecks are of frequent occurrence. The heavy broken seas are probably due to the shoaling off the entrance, the irregularity and velocity of the currents, and the conflict between the wind drawing out of the strait and that along the outer coast.

(246) The rainfall in the vicinity of the entrance is considerable, even during the summer, although the heaviest rains occur between December and March.